Surveys of wetlands and waterbirds in Cagayan valley, Luzon, Philippines

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In November 2001 and January 2002, we searched the entire Cagayan valley, north-east Luzon, Philippines for wetlands and congregations of waterbirds. Five wetlands were identified that held substantial numbers of waterbirds. Important numbers of the endemic Philippine Duck *Anas luzonica* (Vulnerable) were observed at two lakes, as well as large numbers of Wandering Whistling-duck *Dendrocygna arcuata*, Northern Shoveler *Anas clypeata* and Great Egret *Casmerodius albus*. Other records included the first Philippine record of Ruddy Shelduck *Tadorna ferruginea*, the second Philippine record of Dunlin *Calidris alpina*, and the first record of Chinese Egret *Egretta eulophotes* (Vulnerable) on the mainland of northern Luzon. The absence of Sarus Crane *Grus antigone* and Spot-billed Pelican *Pelecanus philippensis* suggests that these species are now indeed extirpated in the Philippines. Two wetland areas, Lake Magat and Malasi lakes, qualify as wetlands of international importance under the criteria of the Ramsar convention on the basis of the count results presented here. Currently, none of the wetlands of Cagayan valley is officially protected by the Philippine government.

INTRODUCTION

Wetlands are among the most threatened ecosystems of the Philippines, mainly as a result of drainage and reclamation (DENR and UNEP 1997). Other important threats include exotic species introductions, over-exploitation, pollution and siltation as a result of forest cover loss in watershed areas (DENR and UNEP 1997). The Philippines has been a contracting party of the Ramsar convention since 1994 and thereby committed itself to the conservation of wetlands of international significance (Wetlands International 2002).

Efforts to identify and protect important wetland areas for birds in the Philippines (Haribon Foundation 1989, PAWB 1993, Wetlands International 1997) have had some results: a number of important wetland sites have been identified and four Ramsar sites have been established in the country. These are: Olango island (Visayas), Naujan lake (Mindoro), Agusan marsh (Mindanao) and Tubbataha reefs in the Sulu Sea. In northern Luzon, two important wetland sites have been identified: Palaui island and Buguey wetlands (Haribon Foundation 1989). In addition, the Buguey wetlands have been identified as an Important Bird Area but the site has no official protected status yet (Mallari *et al.* 2001). Apart from the identification of these two coastal wetland areas, only limited ornithological exploration has taken place in the Cagayan valley area and most of this occurred more than 40 years ago (Dickinson *et al.* 1991, Mallari *et al.* 2001), despite the fact that this is the largest river basin in the Philippines. Whereas data have recently been published for 20 coastal wetlands of Isabela province (NORDECO and DENR 1998), reliable information for Cagayan valley does not exist, remains incomplete or is outdated.

METHODS

In November 2001 and January 2002, the Cagayan valley was systematically searched with the assistance of local guides for congregations of waterbirds. We focused on freshwater wetlands and therefore did not visit Palaui island, a coastal wetland with intertidal reef-flats that are important as a staging area for migratory shorebirds (Haribon Foundation 1989). Five locations containing significant numbers of waterbirds were identified: Cagayan river delta, Buguey wetlands, Linao swamp, Malasi lakes and Lake Magat (see Fig. 1). A GPS receiver was used to determine the exact location of the study areas. All sites were surveyed using binoculars and/or a spotting scope mounted on a tripod. At Malasi lakes and Linao swamp, total overview counts from a fixed point were made. At Lake Magat, Cagayan river delta and Buguey wetlands, motorised boats were used to cover large areas. In most cases counts were repeated, and the maximum number is presented here. Conservation status is taken from BirdLife International (2001).

CAGAYAN VALLEY WETLANDS

The Cagayan valley is enclosed by two major mountain ranges: the Cordillera mountains in the west and the Northern Sierra Madre mountains in the east. The Cagayan valley is situated in the provinces of Cagayan, Isabela and parts of Quirino, Aurora and Nueva Vizcaya. The climate is characterised by the absence of a pronounced rainy period and by a short dry season from February to May. The valley is only partly sheltered from the influence of the north-east and south-west monsoons and is frequently subject to the impact of tropical cyclones. Annual rainfall is about 2,000 mm (PAGASA 2003).

The landscape is characterised by a variety of wetlands, which provide suitable conditions for waterbirds: mudflats on the Cagayan riverbanks, irrigated rice paddies in the lowlands, lakes in the slightly undulating grasslands that enclose the valley, and tidal marshes and mangrove swamps in the coastal zone where the Cagayan river drains in the Babuyan channel. These wetlands are of crucial importance for the livelihood of the human population: the Cagayan valley is one of the most important agricultural areas of the Philippines. The main crops are rice and corn while drier areas on the fringes of the floodplains of the Cagayan river are used as pastureland (Department of Agriculture 2003).

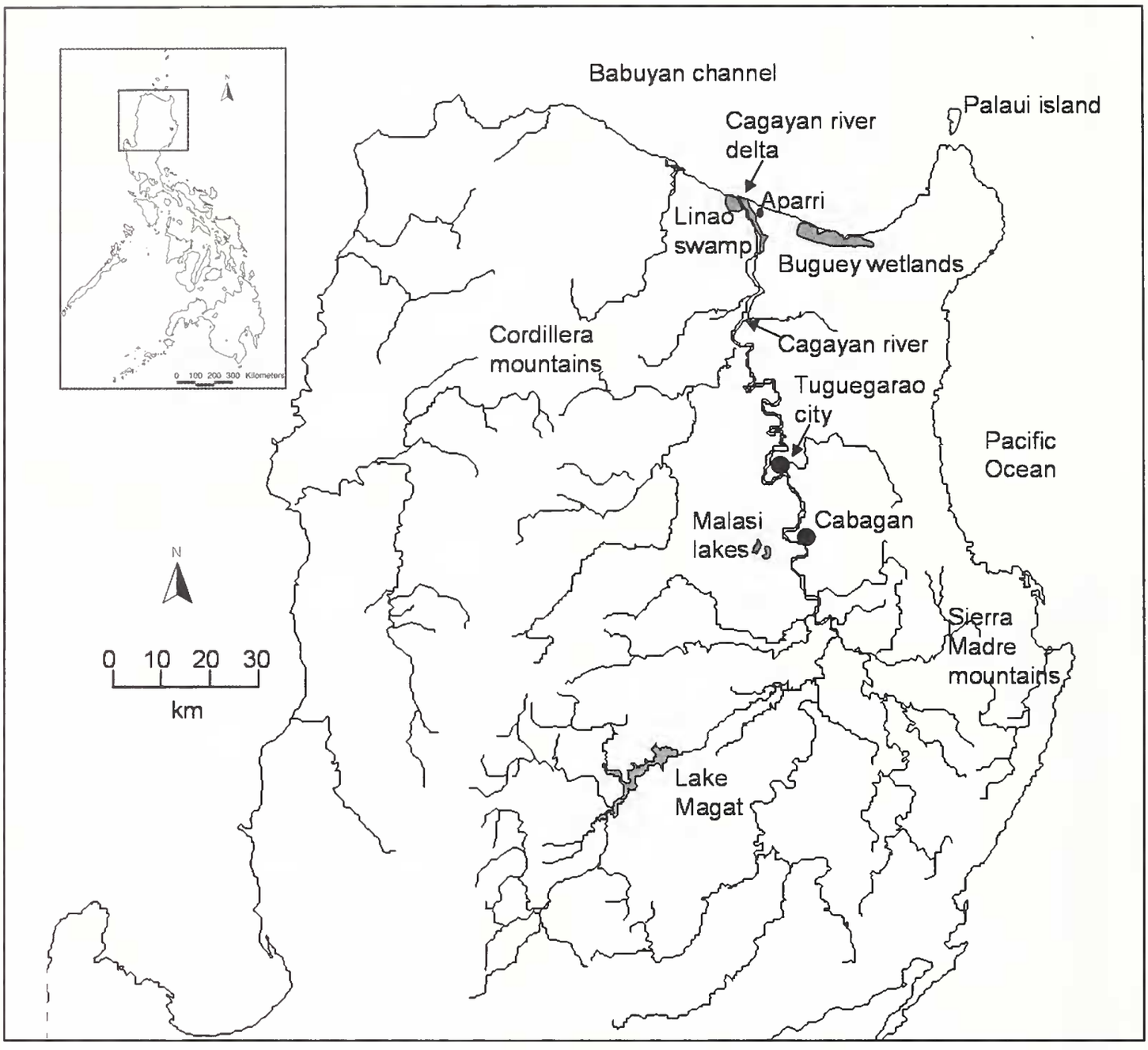

Figure 1. Northern Luzon with its main rivers and the wetlands and other locations mentioned in the text.

Cagayan river delta

This is a c.2-km wide river mouth at the town of Aparri where the Cagayan river ends abruptly in the Babuyan channel. There is a considerable influence of the tide on water level and the river is likely to be brackish far inland. The area counted stretched from the mouth to 12 km inland. Large, sparsely vegetated or bare sandbars are located in the middle of the river. These sandbars contained large numbers of mostly migratory waders. In the open water of the river ducks were present. The riverbanks are vegetated with reed or have been converted into grazing areas and rice paddies. Pasturelands are intensively used for the grazing and bathing of domestic water buffaloes and consequently have many waterholes and patches of shrub vegetation, which provide a habitat for herons and waders. Hunting of waterbirds in the river seems to be a minor threat; local informants confirmed that occasionally ducks were hunted using shotguns. Pollution and conversion of floodplains into rice paddies are threats to waterbirds at this site.

Buguey wetlands

These comprise a complex of coastal lagoons, freshwater marshes, brackish and saline marshes, mangrove swamps, intertidal mudflats, rice paddies, and fish ponds (Mallari *et al.* 2001). The wetlands are considered to be an important staging and wintering area for migratory waterbirds: 3,000–5,000 ducks were recorded here in November 1986 along with up to 3,000 other waterfowl (Haribon Foundation 1989). The continuous destruction of habitat by the creation of shrimp- and fish-ponds, plus widespread hunting are major threats to the wetland and its waterbirds (Haribon Foundation 1989). Few waterbirds and no ducks were encountered here during our survey in January 2002, but we did not cover the entire area. Interviews with local inhabitants, however, indicated that no large congregations of waterbirds can presently be found in the Buguey wetlands and that hunting has severely reduced the local duck populations.

Table 1. Summary of wetlands and survey dates.

Wetland	Coordinates	Size	Status	Survey dates
Cagayan river delta (Cagayan province)	18°16′N 121°40′E	River mouth is 2 km wide; at 12 km inland the river is 500–1,000 m wide.	Not protected	2–3 November 2001 25 January 2002
Buguey wetlands (Cagayan province)	18°17′N 121°50′E	c.3,000 ha	Not protected	24 January 2002
Linao swamp (Cagayan province)	18°16′N 121°30′E	c.3,000 ha	Not protected	25 January 2002
Malasi lakes (Isabela province)	17°24′N 121°41′E	Permanent lake: 6 ha Seasonal lake: 4 ha	Locally protected	28 November 2001 27 January 2002
Lake Magat (Isabela province)	16°47′N 121°22′E	c.1,500 ha	Not protected	25 November 2001 26 January 2002

Linao swamp

This is an extensive wetland characterised by nipa *Nypa fruticans* swamps, mangroves, small lakes and tidal marshes. Various rivers and creeks cross the sparsely populated swamp. Irrigated rice fields are located at the eastern border. Domestic water buffaloes frequent the swamp. Large flocks of ducks were observed in Linao, but most birds were too distant to identify. Herons and waders were present in relatively large numbers. Agricultural encroachment and the creation of fishponds threaten this poorly known wetland. We have no information on hunting levels in this area. Further surveys are needed to assess the status and importance of this site.

Malasi lakes

These are two natural lakes situated in open grassland about 3 km west of the Cagayan river in the municipality of Cabagan. One lake is used for irrigation purposes and has been artificially deepened. Large parts of the other lake were covered with reeds and other vegetation, providing suitable breeding conditions for waterbirds. In both lakes, large congregations of ducks were found. Local people reported the ducks occurred year-round (indicating the presence of resident breeders), with larger numbers in winter and particularly in spring (probably referring to ducks on northward migration). The site has recently been declared a municipal bird sanctuary through a local ordinance. Hunting and collection of eggs are no longer allowed in and around the lakes, and agricultural development will be limited in the perimeter of the lakes. The municipality of Cabagan intends to develop the area around the lakes as an environmental education and ecotourism area, with a hide and basic facilities for visitors. Sustainable hunting of ducks may be allowed in future to generate revenue.

Magat dam

This was constructed in 1984 for hydro-electrical and irrigation purposes, creating an artificial lake in the Magat river. The lake area directly adjacent to the dam is used for the cultivation of tilapia *Oreochromis niloticus* in large cages. The owners of these cages have created floating villages on the lake, using motorised boats for transport. Further away from the dam, where the lake is bordered by high cliffs, human impact is considerably less. In the middle of the lake a large congregation of ducks was found. Ducks and egrets are hunted with guns in Lake Magat. The lake offers good opportunities for birdwatching and water-based tourism and many local tourists visit the dam which is one of the highest in South-East Asia.

SIGNIFICANT RECORDS

GREAT EGRET *Casmerodius albus*
A total of 220 was observed at Lake Magat in November 2001.

CHINESE EGRET *Egretta eulophotes* (Vulnerable)
One solitary individual was observed on a small sandbar in front of the harbour of Aparri from a distance of c.50 m on 3 November 2001. The bill (yellowish below, black above) and brown-greenish legs distinguished it from Little Egret *E. garzetta* and the white phase of Pacific Reef Egret *E. sacra* (Sonobe and Usui 1993, Kennedy *et al.* 2000). The Philippines are considered to be the most important wintering area for this species, notably the Eastern Visayas (Collar *et al.* 1999). Previously, the species has been recorded on the Batanes islands and the Babuyan islands north of Aparri, and in the central plain of Luzon (Collar *et al.* 1999).

PHILIPPINE DUCK *Anas luzonica* (Vulnerable)
On 25 November 2001, 2,000 individuals were observed at Magat dam in a flock that also contained Garganey *Anas querquedula*, Northern Shoveler *Anas clypeata*, Northern Pintail *Anas acuta* and Tufted Duck *Aythya fuligula*. In January 2002, only 610 Philippine Ducks were present. According to a local informant the ducks breed in the grasslands in the surrounding hills during September–November. On 28 November 2001, 1,200 Philippine Ducks were counted at Malasi lakes, mixed with Wandering Whistling-duck *Dendrocygna arcuata*, Northern Shoveler, Northern Pintail, Garganey and Eurasian Wigeon *Anas penelope*. In January 2002, the flock held 1,320 Philippine Ducks. The species has been observed previously in large flocks on Luzon, for example at Candaba marsh where thousands were reported in the 1980s (Collar *et al.* 1999). However, the species disappeared from Candaba during the 1990s following destruction of this marsh (Collar *et al.* 1999). Philippine Duck was

reported in the Buguey wetlands in 1986, with this species forming a significant proportion of a flock of 3,000–5,000 ducks (Haribon Foundation 1989); however, we observed none.

Large flocks of this species were observed at the mouth of Cagayan river in the 1890s (Collar *et al.* 1999), but we only observed 16 individuals. Other previous records from the valley are from Solana and Penablanca (Sisim), both not far from Malasi lakes (Collar *et al.* 1999). The species has also been observed in small numbers in coastal wetlands of the Northern Sierra Madre Natural Park, the largest protected area of the Philippines (NORDECO and DENR 1998). An unknown number of Philippine Ducks were among the large flocks of an estimated total of 10,000 ducks that were observed at Linao swamp.

The total population of this species has recently been estimated at 2,500–10,000 individuals, and numbers are declining in most of its known areas. It is therefore categorised as Vulnerable (BirdLife International 2001). Lake Magat and Malasi lakes harboured at least c.20% (in November 2001) and c.13% (in January 2002) respectively of the total estimated population.

Ruddy Shelduck *Tadorna ferruginea*
A solitary individual was sighted at Lake Magat on 25 November 2001. It was seen both perched and in flight, as close as 50 m. Its large size, long neck, pale orange head and neck and darker orange body identified it immediately as Ruddy Shelduck. In flight, the bird showed a large white wing patch and white underwings. The bird was also later seen by T. Fisher (verbally 2001), but we could not relocate it in January 2002. The easternmost populations of Ruddy Shelduck winter in South-East Asia from China south to Thailand (Miyabayashi and Mundkur 1999). No waterfowl collections in northern Luzon are known to us, and the bird appeared wary and did not mix with the other groups of ducks, hinting that it was more likely to have been of wild origin than an escape. As a previous claim of this species at Pangasinan, Luzon was not accepted by Kennedy *et al.* (2000), this record therefore represents the first for the Philippines.

Northern Shoveler *Anas clypeata*
On 26 January 2002, 278 individuals were observed at Lake Magat, and on 27 January 1,920 were counted at Malasi lakes. Smaller numbers were observed at Cagayan river delta and Linao swamp. In the Philippines this was previously described as being uncommon and found in pairs or small groups (Kennedy *et al.* 2000). Our observations suggest that it may be a common winter visitor in northern Luzon.

Wandering Whistling-duck *Dendrocygna arcuata*
A large group of 3,050 was observed at Malasi lakes on 27 January 2002.

Malaysian Plover *Charadrius peronii* (Near Threatened)
One individual was observed in a group of 80 Lesser Sand Plover *C. mongolus* on a sandbar at the mouth of the Cagayan river on 3 November 2001.

Dunlin *Calidris alpina*
A group of 17 with Kentish Plovers *Charadrius alexandrinus* was observed on a large sandbar in Cagayan river delta on 3 November 2001. At first sight, the birds appeared similar to nearby Curlew Sandpipers *Calidris ferruginea*, but the bill was less curved, and in flight the rump was brown-grey, and not white. The upperparts were uniformly grey, the breast was whitish streaked grey-brown and the belly was white. In flight, a white wingbar was visible. No call was recorded. The birds were much larger than the Kentish Plovers with which they were mixed, thus excluding possible confusion with smaller sandpipers (Hayman *et al.* 1986). This is the second record for the Philippines following one at Aparri in 1988 (Erritzoe 1994). In January 2002, two Dunlin were observed in the same area.

DISCUSSION

Species not recorded

The plains and marshes of the Cagayan valley were long thought to be the last area in the archipelago where Sarus Crane *Grus antigone* might occur (Kennedy *et al.* 2000). Most records of this species in the Philippines are from Cagayan valley and date back to the 1910s (BirdLife International 2001). The lack of records in this survey reinforces claims that the species has been extirpated in the Philippines (Kennedy *et al.* 2000, BirdLife International 2001). A similar conclusion can be drawn for the Spot-billed Pelican *Pelecanus philippensis*. A mounted specimen was reportedly obtained from Cagayan valley in the 1960s (Kennedy *et al.* 2000). Local informants did not recognise drawings of the species and we conclude that it is no longer found in north-east Luzon.

Local informants also did not recognise drawings (from Kennedy *et al.* 2000) of Black-faced Spoonbill *Platalea minor* (Endangered), which has recently been sighted on the Batanes islands (Mendoza *et al.* 2002), about 250 km north of Luzon, nor Black-headed Ibis *Threskiornis melanocephalus* which is a rare winter visitor to Luzon and Mindoro (Dickinson *et al.* 1991, Kennnedy *et al.* 2000). Darter *Anhinga melanogaster* and Glossy Ibis *Plegadis falcinellus* could be expected to be present in the wetlands of northern Luzon but were not encountered. Darter is well known among local people in San Mariano, a town bordering Cagayan valley in Isabela province, and used to be found in local rivers in the past but apparently has not been sighted during the last ten years (F. Danielsen *in litt* 2003, M. van Weerd unpublished data). NORDECO and DENR (1998) reported sightings of the Oriental Stork *Ciconia boyciana* (Endangered), Woolly-necked Stork *Ciconia episcopus*, and Spoon-billed Sandpiper *Calidris pygmea* (Endangered) on the Pacific Ocean side of the Sierra Madre mountains. These species were not observed along the coast and the interior of the Cagayan valley and local inhabitants did not recognise drawings of the two storks. Also surprising was the absence of Pheasant-tailed Jacana *Hydrophasianus chirurgus*.

Wetland conservation

In most freshwater wetland ecosystems in the Philippines the main threats are drainage for irrigation

and agricultural reclamation (DENR and UNEP 1997). Hunting is an additional threat for waterbirds (Collar *et al.* 1999, Mallari *et al.* 2001). This is equally true for the Cagayan valley: few natural lakes remain in the valley, while most of the original floodplain has been converted into rice fields. Hunting pressure seems to be very high in Buguey wetlands, but lower in the Cagayan river delta and on Lake Magat. Hunting is banned on the Malasi lakes.

Mallari *et al.* (2001) identified Buguey wetlands as an Important Bird Area. Our limited survey results did not provide good support for this, but further surveys at different times of year would be useful. Both Lake Magat and Malasi lakes would qualify as Ramsar sites based on their populations of Philippine Duck. Linao swamp merits further studies and could prove to be of great importance for migrant and resident duck populations.

No wetland in the Cagayan valley is currently protected by the national government, although the local government of Cabagan has protected Malasi lakes and its waterbirds. Decentralisation of legislative powers in the Philippines makes it possible now for local governments to adopt their own conservation and natural resource management laws.

Over recent years in the Philippines, the endemic tropical forest birds have received most attention from conservationists and ornithologists (Poulsen 1995, DENR and UNEP 1997, Collar *et al.* 1999, Mallari *et al.* 2001). However, the survival of birds that for centuries have been taken for granted as an integral part of the countryside (Dolman 2000) could prove to be of crucial importance for the mobilisation of broader support for nature conservation (van den Born *et al.* 2001). In this light, the protected status afforded to Malasi lakes by the local government of Cabagan indicates that local people can and will contribute significantly to the conservation of threatened species, especially if it concerns species or habitats which play a role in their daily lives.

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APPENDIX

Waterbird counts in Cagayan valley in November 2001 and January 2002

Species	Status[1]	Cagayan river delta		Malasi lakes		Lake Magat		Buguey wetlands	Linao swamp	Total	
		Nov 2001	Jan 2002	Nov 2001	Jan 2002	Nov 2001	Jan 2002	Jan 2002	Jan 2002	Nov 2001	Jan 2002
Little Grebe *Tachybaptus ruficollis*	R			25	42					25	42
Grey Heron *Ardea cinerea*	M	2	6	1	2	1			16	4	24
Purple Heron *Ardea purpurea*	R	1	2	1	1	5		2	7	7	12
Great Egret *Casmerodius albus*	M	7	6	7	3	220	208	11	52	234	280
Pacific Reef Egret *Egretta sacra*	R	1								1	0
Intermediate Egret *Mesophoyx intermedia*	M	9	2	11		2		1	49	22	52
Chinese Egret *Egretta eulophotes*	VU, M	1								1	0
Little Egret *Egretta garzetta*	M	15	2	1		102	71	3	17	118	93
Little Heron *Butorides striatus*	R					1		2		1	1
Cattle Egret *Bubulcus ibis*	R	14	1	20					51	34	52
Cinnamon Bittern *Ixobrychus cinnamomeus*	R					5			1	5	1
Yellow Bittern *Ixobrychus sinensis*	R	1				9			4	10	4
Black Bittern *Dupetor flavicollis*	R	1								1	0
Wandering Whistling-duck *Dendrocygna arcuata*	R			1,228	3,050					1,228	3,050
Ruddy Shelduck *Tadorna ferruginea*	M					1				1	0
Northern Pintail *Anas acuta*	M			30	21	1	1		500	31	522
Philippine Duck *Anas luzonica*	VU, R		16	1,200	1,320	2,000	610		34	3,200	1,980
Eurasian Wigeon *Anas penelope*	M			2	46					2	46
Garganey *Anas querquedula*	M			260	100	30	243			290	343
Northern Shoveler *Anas clypeata*	M	4		1,320	1,920	10	278		1	1,334	2,199
Tufted Duck *Aythya fuligula*	M	20	80	71	32	1			4	92	116
Unidentified ducks									10,000	0	10,000
Osprey *Pandion haliaetus*	M	1		1		2	1			4	1
White-bellied Sea Eagle *Haliaeetus leucogaster*	R		2							0	2
Eurasian Marsh Harrier *Circus aeruginosus*	M			1	2					1	2
Pied Harrier *Circus melanoleucos*	R		1	2						2	1
Slaty-breasted Rail *Gallirallus striatus*	R					1				1	0
Barred Rail *Gallirallus torquatus*	R					1				1	0
White-breasted Waterhen *Amaurornis phoenicurus*	R					2				2	0
Common Moorhen *Gallinula chloropus*	R		1	2	41					2	42
Common Coot *Fulica atra*	M				15					0	15
Grey Plover *Pluvialis squatarola*	M	1						17		1	17
Pacific Golden Plover *Pluvialis fulva*	M								192	0	192
Little Ringed Plover *Charadrius dubius*	R			5						5	0
Kentish Plover *Charadrius alexandrinus*	M	254	341					360		254	701
Malaysian Plover *Charadrius peronii*	NT, R	1								1	0
Lesser Sand Plover *Charadrius mongolus*	M	251						1		251	1
Greater Sand Plover *Charadrius leschenaultii*	M	3						17		3	17
Eurasian Curlew *Numenius arquata*	M	9						3		9	3
Whimbrel *Numenius phaeopus*	M							1		0	1
Common Greenshank *Tringa nebularia*	M	22	73	2				3		24	76
Common Sandpiper *Actitis hypoleucos*	M	3	1	4						7	1
Wood Sandpiper *Tringa glareola*	M			1					6	1	6
Marsh Sandpiper *Tringa stagnatilis*	M	4							70	4	70
Ruddy Turnstone *Arenaria interpres*	M							90		0	90

Species	Status[1]	Cagayan river delta		Malasi lakes		Lake Magat		Buguey wetlands	Linao swamp	Total	
		Nov 2001	Jan 2002	Nov 2001	Jan 2002	Nov 2001	Jan 2002	Jan 2002	Jan 2002	Nov 2001	Jan 2002
Unidentified snipe *Gallinago* sp.	M	8							4	8	4
Red-necked Stint *Calidris ruficollis*	M	3								3	0
Curlew Sandpiper *Calidris ferruginea*	M	6								6	0
Dunlin *Calidris alpina*	M	17	2							17	2
Unidentified waders			125							0	125
Black-headed Gull *Larus ridibundus*	M		8			3		20		3	28
Common Kingfisher *Alcedo atthis*	M	2	1			4		1	2	6	4
White-throated Kingfisher *Halcyon smyrnensis*	R					2				2	0
Collared Kingfisher *Todiramphus chloris*	R	2						4		2	4
Oriental Reed Warbler *Acrocephalus orientalis*	M	21								21	0
Total no. individuals		684	670	4,195	6,595	2,403	1,412	535	11,010	7,282	20,222
Total no. species	53	29	18	22	14	21	7	16	18	48	40

[1]NT = Near Threatened, VU = Vulnerable (BirdLife International 2001); M = Migrant, R = Resident (Kennedy *et al.* 2000)